System and method for coating dimensionally stable construction materials

The invention relates to a system and a method for coating dimensionally stable construction materials, in particular facade components, as protection against environmental influences.

Different materials which can be used as weather protection with long-lasting effect were employed for coating dimensionally stable construction materials, for example wooden boards or masonry. These are, for example, gypsum fiber boards, wood fiber boards, sand-bound, glass fiber-reinforced lightweight concrete panels or rendering with a cement-based render material.

Disadvantages of the materials used to date and known from the prior art are the limited applicability to various substrate materials and the very complicated application of the weather protection to the construction materials in some cases. In addition, aging phenomena, such as cracks or color changes, occur in the case of some coatings and require expensive reconstruction or renovation.

It is an object of the present invention to provide a system and a method for coating dimensionally stable construction materials, by means of which the construction materials can be protected from the influences of weathering in a rapid, simple and durable manner.

According to the invention, this object is achieved by applying a base material having rubber-elastic behavior to the construction material, a reinforcing mat being embedded in the base material. In a second operation, an outer layer which comprises a polymer, in particular

an acrylic polymer, or a copolymer, in particular acrylic copolymer, as a binder is applied to this base material so that the resilient base material compensates movements within the coated construction material, and the outer layer provides a covering which is resistant to weathering and resistant to environmental influences.

The base material advantageously contains a rubber, an elastomer or a rubber material so that the base material is coatable and self-adhesive. This permits easy application to the construction material to be coated. The base material preferably contains milled rubber parts, partly comprising recycled material, in order to reduce the consumption of primary raw materials.

In addition to the binder comprising acrylic copolymer, the outer layer or the material used as the outer layer contains titanium dioxides, quartz or calcite as fillers, resulting in a prevailing white base hue which can be changed by adding color or colored pigments as desired. It is also possible to produce a surface having different roughnesses by means of the fillers.

The reinforcing mat is advantageously woven fabric or knitted fabric in order to increase the stability of the applied base material on the construction material, the reinforcing mat advantageously consisting of fiber materials, in particular glass fibers. Owing to the mesh-like structure of the mat, the dimensional stability of the self-adhesive base material is increased.

Before application of the outer layer, the base material is advantageously smoothed so that the outer layer, optionally the colored outer layer, can be applied as desired on a base surface which is as flat as possible. For the sake of simplicity, the outer

layer is applied by spreading or filling, it being possible for application to be effected by means of a brush or putty knife. When profiled putty knives are used, virtually any desired structures of the outer layer on the base material can be produced.

An embodiment of the invention is explained in more detail below with reference to the attached figure which shows a model structure of a building facade.

The figure shows a part of a building façade in a foundation, a construction paper or a construction sheet 6 having been applied to a support structure 5. A dimensionally stable, panel-like construction material 1 is mounted, for example screwed on, in front of this construction sheet 6. The construction material 1 is advantageously a wood-base material, such as a particle board, an OSB board or a fiber board, which can be used for erecting a facade. A skirting board 7 forms the lower and outer end of the facade. As an alternative to the wood-base materials mentioned, the panels may also consist of concrete or styropor, and the facade may optionally also consist of a masonry material.

The construction material 1 in its end position is then cleaned to remove impurities, and cracks and uneven areas present are filled. This ensures that a smooth surface is present.

After the pretreatment of the surface to be coated, a reinforcing mat 3 is cut to the desired dimensions, passages or cut-outs in the surface being cut out with an excess of about 15 cm remaining at the edges. A base material 2 comprising a material having rubber-elastic behavior is then applied to the surface of the construction material 1 and at the same time the reinforcing mat 3 is embedded in the coat of the base material 2. The base material 2 can be applied by means of a brush or a trowel; after application of the base

material 2 on the surface of the construction material 1, said base material adheres by itself together with the reinforcing mat 3 and forms a first protective layer for the construction material 1. The surface of the base material 2 can be smoothed, for example, by means of a brick trowel.

As an outer final coat, an outer layer 4 is applied, preferably by brushing, to the surface of the base material 2, the outer layer 4 consisting of an acrylic polymer or acrylic copolymer as a binder. Fillers, such as titanium dioxide, quartz or calcite, are added to this acrylic polymer or acrylic copolymer, and the mixture is diluted by means of water. In order to ensure uniform processibility, the dilution must be constant, in particular in order to ensure a uniform color on addition of colored pigments. The colored pigments are added to the acrylic copolymer/acrylic polymer immediately before the outer layer 4 is brushed on and are mixed as desired. By using different brushes for brush-coating or putty knife-coating tools, different structures of the outer layer 4 can be achieved, depending on which tools are used.

The system and method according to the invention reduce the work involved and hence the costs for weather protection by a coating or an outer layer of construction materials, such as wooden boards, fiber boards, OSB boards or other facade elements. The system is suitable in particular as weather protection of wood components, such as wall elements for wooden houses by the panel construction method. As an alternative to the use on wood-base materials, said system can be used for coating and for protection against influences of weathering on gypsum plasterboards, concrete or masonry. Owing to the rubber-elastic properties of the base material 2, it is possible to provide a flexible coating resistant to weathering, it being possible to color the outer layer 4 as desired. The coating thus

protects the material used against weathering by means of a hard and at the same time resilient covering.

By means of the system, protection against weathering is possible in all climatic regions from extreme humidity to aridness, from intense heat to temperatures well below freezing. The starting materials of the base material 2 and of the outer layer 4 may be recycled products, so that the entire coating system is very environmentally friendly.

Owing to the rubber-elastic properties of the base material, the coating is insensitive to hairline cracks in the outer coat, which may be caused by settling of the building or material movements relative to one another. The penetration of moisture into cavities is prevented, as is damage by weather or wear.

The outer layer 4 can be provided with various degrees of graininess by adding corresponding fillers, so that a large number of design possibilities is available. Owing to the self-adhesive properties of the base material 2 and the low aggressiveness to other materials, it is possible to use the coating on virtually any substrate from concrete to styropor.

The base material 2 is prepared according to the formulation shown below.

	Material	Amount in kg
Addition of #1 and 2 and mixing at low speed for 2 minutes 		
#1	H2O	180.0
#2	KTTP	5.0
Add #3 to #6 at low speed 		
#3	296D	48.0
#4	N5667	308.0
#5	TEXANOL	7.2
#6	PRO-GLYCOL	8.8
Slowly add #7 until fluidization occurs, ensuring that nothing comes into contact with the sides of the mixing container, in order to prevent agglomeration Duration of mixing 10 minutes 		
#7	BENTOLITE WH	10.5
Add #8 + #9. Mix for 20 minutes at high speed 		
#8	CR-628	90.0
#9	MICRONA-7	268.0

Reduce the speed of the mixer to middle level. Add #10 to #13. In particular, ensure that #13 has the exact weight.

#10	COLLOID 640	1.0
#11	NUOSEPT-95	4.9
#12	NUO-404D	5.0
#13	AMMONIA	1.6

Premix #14 into #15 in a clean tub and immediately add for mixing. Carry out the same with #16 + #17. Mix for 45 minutes. The mixture should be smooth and creamy.

#14	H2O	11.0
#15	BERMOCOLL 41I-FQ	2.8
#16	H2O	11.0
#17	BERMACOLL 41I-FQ	2.8

Transfer the mixture to the blue mixer

Add #18 and 19 - mix for 25 minutes (do not mix for longer!)

#18	-40 RUBBER FRAGMENTS	270.0
#19	IMASCO SAND "0"	541.0

Fill tub up to 23 kg